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Dr. Thomas Taylor¹² of a work on mushrooms, with colored plates of reasonably good quality, will doubtless meet with an appreciative response. Dr. Taylor was for many years the microscopist of the United States Department of Agriculture, and the readers of this journal do not need to be told the character of his work. In this official capacity he issued a number of reports on mushrooms, which have furnished some of the material for the present series.

Although the subject is not treated in a sufficiently systematic way properly to entitle the work to the name of "handbook," and in spite of some irrelevant matter, the mycophagist will yet find much in these pages to help him.—J. C. A.

NOTES FOR STUDENTS.

A NEW *Rumex* from Colorado has been described by Geo. E. Osterhout.¹³—Further notes on the southern species of *Asarum* have been published by W. W. Ashe.¹⁴—Professor E. L. Greene¹⁵ has published another fascicle of "New or noteworthy species," in which the following genera are represented by new species: *Delphinium*, *Myosurus*, *Viola*, *Mertensia*, *Plagiobothrys*, *Lithospermum*, and *Eriogonum*. In "Studies in Compositæ" some helenioid genera are taken up. The name *Actinella*, as employed by Nuttall and by Gray, is a homonym, and Rafinesque's *Ptilepida* (used in the *Check List*) is precluded as a synonym of Persoon's *Actinella* and not of Nuttall's. Accordingly Professor Greene publishes the name *Tetraneuris*, under which he places eighteen species. Hooker's *Picradenia* is kept separate from it, and a new genus, *Rydbergia*, is founded on *Actinella grandiflora* T. & G.—Those wishing to keep pace with the synonymy of the species of *Asarum* should not fail to note the recent brief paper by James Britten and Edward G. Baker, who introduce the new name *A. Shuttleworthii*.¹⁶—J. M. C.

HERMANN VON SCHRENK'S¹⁷ study of the influence of the tornado of 1896 upon the trees of St. Louis is an important contribution to the general subject of the effect of extraordinary conditions upon plant life. Mr. von Schrenk's

¹² TAYLOR THOMAS.—Student's handbook of mushrooms of America, edible and poisonous. Washington, A. R. Taylor (238 Mass. Ave., N. E.). 8vo. In five numbers of twenty-four pages, and five or six partly colored plates each. 1897-8. 50 cents per number.

¹³ *Frythea* 6: 13. 1898.

¹⁴ *Jour. of the Elisha Mitchell Soc.* 14: 31-36. 1897.

¹⁵ *Pittonia* 3: 257-272. 1898.

¹⁶ *Jour. Bot.* 36: 96-99. 1898.

¹⁷ The trees of St. Louis as influenced by the tornado of 1896. *Trans. St. Louis Acad. Sci.* 7: 25-41. 1897.

observations of the striking phenomena he describes are extensive and valuable. Finding the immense destruction of leaves to have been the most serious damage done by the storm, he points out the disastrous results of the stoppage of the transpiration current and of the manufacture of nutritive products at a time when the uninjured roots were at a period of their greatest absorbing activity. Where the deficiency in leaf exposure was partially made up either by adventitious budding or by premature growth from the leaf axils of the undestroyed twigs of 1896, careful observations were made of the unnatural "growth ring" thus established. This ring, very evident in the surviving twigs, easily traceable in the larger branches of several years formation, was not to be observed in the main trunk. In very many cases, even where the normal functions seemed to have been restored, trees have since died on account of injuries received by the bark, either by violent wrenching or by later intensified insolation. In the latter case, when the temperature between wood and bark must have risen to a height which destroyed the delicate cambium, the bark has since peeled off before the vegetative parts of the tree have shown signs of withering. Such bark-scorching was almost universal, and Mr. von Schrenk predicts that many of the finest trees for this reason will be unable to stand the strain of another summer. Six plates amply illustrate the text.—J. G. COULTER.

F. HEGELMAIER¹⁸ has made an interesting contribution to the subject of polyembryony. In *Allium odorum* he finds embryos developing not only in the normal manner, but also from synergids, antipodals, and from the wall of the inner integument. One embryo sac contained five embryos, one normal, another from a synergid, two from antipodal cells, and still another from the inner integument. Many irregularities were noted both in the suspensor and in the embryo proper. The stock from which the material was taken had been cultivated in gardens for over twenty years.—CHAS. J. CHAMBERLAIN.

A SOMEWHAT MISCELLANEOUS summary of late embryological work is given in the *Rev. Gen. Bot.* of June 1897. The contributions reviewed range from the work of Chauveaud¹⁹ upon polyembryony among the Asclepiadaceæ to Belajeff's well known study of the phenomena of the pollen tube in gymnosperms,²⁰ and Guignard's *Nouvelles études sur la fécondation*.²¹ It is

¹⁸F. HEGELMAIER.—Zur Kenntniss der Polyembryonie von *Allium odorum*. Bot Zeit. 55: 133-140. 1897.

¹⁹Sur la fécondation dans les cas de polyembryonie. Reproduction chez le Tompevenin. Paris, Soc. d'edit. sci., 1892.

²⁰Zur Lehre von dem Pollenschlauche der Gymnospermen. Ber. der deutsch. bot. Gesell. 11: 196-201. 1893.

²¹Ann. des Sci. Nat. VII. 14: —. 1891.

too incomplete to be taken for a bibliography of even the most critical of recent contributions in this field, but does offer an easy way of getting at the gist of several valuable but verbose contributions. In the issue of October 15 M. Prunet gives a clear presentation of the embryological investigations of Jaccard²² on *Ephedra* and of Karsten²³ on *Gnetum*.—J. G. COULTER.

BY PLACING etiolated leaves, from which the carbohydrate substances have been as completely removed as possible, in contact with various solutions, M. W. Palladine²⁴ has demonstrated the beneficent influences of certain substances upon the formation of chlorophyll and the retarding effect of others. He lists among substances favorable to chlorophyll formation saccharose, raffinose, glucose, fructose, maltose, glycerin, galactose, lactose, and dextrin. Inuline and tyrosine have no perceptible effect under the conditions employed, while contact with mannite, dulcitol, asparagin, urea, alcohol, chloride of ammonia, and quinic acid either checks or absolutely prevents its formation. He also demonstrates by a very simple and efficient experiment that respiration proceeds freely in an atmosphere impoverished of oxygen, in which chlorophyll appears in etiolated leaves not at all or only very slowly.—J. G. COULTER.

RECENT ANNUAL REPORTS from the experiment stations containing botanical information are as follows: The Rhode Island report for 1896 treats of carnation diseases (pp. 203-210) by L. F. Kinney, especially of fairy-ring, rust, and "petrified" buds. The two first mentioned were effectively checked with Bordeaux mixture and removal of diseased leaves; the last is supposed to be due to forcing growth beyond healthful limits, as the buds never open. One-third of the report (pp. 242-318) is devoted to an illustrated account of the extended studies of H. J. Wheeler and G. M. Tucker on the value of lime as a fertilizer for field crops. Beneficial results were obtained with many kinds of plants and at different localities in the state. It is ascribed, after making pot observations, to the corrective action upon soil acidity.

The report of the Vermont station for 1896-7 contains observations upon pollination of the plum (pp. 87-98) by F. A. Waugh, embracing many interesting details; and also some account of the action of enzymes in hastening germination (pp. 106-111), by the same investigator. The botanist of the station, L. R. Jones, writes (pp. 44-74) upon early blight of potato, including a full bibliography of *Alternaria Solani*, upon the effect of disinfectants (cor-

²² Recherches embryologiques sur l'*Ephedra helvetica*. Bul. de la Soc. Vaudoise des Sc. nat. 30: —. 1894.

²³ Beitrag zur Entwicklungsgeschichte einiger *Gnetum*-Arten. Bot. Zeit. 50: —. 1892.

²⁴ Recherches sur la formation de la chlorophylle dans les plantes. Rev. gen. de bot. 9: 385-394. 1897.

rosive sublimate and formalin) on early growth of potatoes, upon apple scald, oat smut, and onion mildew, and upon the orange hawkweed (*Hieracium aurantiacum* L.), for which salt applied dry at the rate of about 3000 pounds per acre is found to be an effective exterminator. All the topics include many new and important observations.

The report of the botanist of the New Jersey station, Byron D. Halsted, has been distributed as a separate in advance of the full report for the year 1897. It is probably the largest report (pp. 261-394) made by any of the station botanists, and records a great number of observations, mostly relating to plant diseases and fungicides. The turnip, cabbage, potato, pepper, tomato, bean, onion, spinach, egg plant, clover, cucumber, pea, carrot, celery, beet, sweet potato, asparagus, pear, violet, hollyhock, and many other cultivated plants have received attention. Beside pathological studies, experiments were made in shading plants with lath screens, advantageously in case of lettuce, spinach, Swiss chard, celery, and bush beans, and injuriously in other cases. The report is illustrated with thirty-two cuts, all half-tones from photographs, and nearly all most wretchedly printed. It seems as unreasonable to print illustrations so badly that nothing can be made out of them as it would be to print the text in a blurred and unreadable condition.—J. C. A.